

NOTES ON SOME RECENT ADDITIONS TO THE EXHIBITION SERIES OF VERTEBRATE FOSSILS.

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INTRODUCTION.

The purpose of these brief notes is to call attention to some of the more important accessions recently placed on exhibition in the court devoted to Vertebrate Paleontology in the U. S. National Museum.

A SKELETON OF RHAMPHORHYNCHUS GEMMINGI Meyer.

One of the specimens secured especially for the Museum exhibit at the Louisiana Purchase Exposition was a well-preserved example (No. 2420)^a of that curious flying reptile, *Rhamphorhynchus gemmingi*, from the lithographic limestone quarries (Upper Jurassic), near Eichstatt, Germany.

This is one of the few specimens in which the impressions of the wing membrane have been preserved. The wing in form somewhat resembled that of the bat, but the membrane was attached only to the fifth or little finger, which had an enormous development. A critical examination of the obverse and reverse slabs (Plates XXX and XXXI) shows the linear depressions along the wing bones produced by the folding of the membrane. The impression of the rhomboidal flap of membrane, which probably acted in the capacity of rudder when in flight, may be seen at the distal extremity of the tail. This specimen, when entombed in the rocks, had the wings folded, but an example of *R. phyllurus* in the Yale University museum and several specimens in the Bayet Collection, now belonging to the Carnegie Museum, Pittsburg, Pennsylvania, show by the impressions that the wings were somewhat extended. One at least in the latter collection has the wings fully open.

Most of the bones are pneumatic—that is, hollow and filled with air, after the manner of birds. The eyes are protected by a ring of sclerotic plates (see Plate XXX), somewhat similar to those found around

^a Catalogue number of the U. S. National Museum.

the eyes of the Ichthyosaurs. The teeth are small, few in number and very sharp. All of the American forms are supposed to be edentulous.

The remains of these reptiles occur in Europe and North America in rocks of Jurassic and Cretaceous age. Pteranodon and allied forms are particularly abundant in the Niobrara chalk of Kansas.

Measurements.

	Inches.
Length of skull	4½
Length of tail	13½
Length of fifth digit.....	18½
Estimated expanse of wings	40

SKULL OF TRICERATOPS CALICORNIS Marsh.

In the series of Ceratopsia remains preserved in the National Museum is a considerable part of a skeleton, the type of *Triceratops calicornis* (No. 4928).^a This species was described^b by Prof. O. C. Marsh just prior to the removal of that part of the fossil vertebrate collection belonging to the U. S. Geological Survey from New Haven to Washington, and was based upon certain peculiarities observed in the nasal horn-core.

Plate XXXII shows the skull and predentary of this animal as it is now exhibited. This specimen Sk. 29^c 2171^d was collected by the late Mr. J. B. Hatcher from the Cretaceous (Laramie), on Lance Creek, Converse County, Wyoming, in 1891.

With the exception of the left parietal (of which only a small portion remains) this side of the skull is very complete. The frill and jugal region of the opposite side are wanting. The other parts of the skeleton preserved are a portion of the atlas, 11 presacral vertebrae, part of the sacrum, portions of both ilia, 2 pubes, quite complete, several cervical and thoracic ribs, and numerous fragments of the skull and other body elements, including many short pieces of the ossified tendons, so common along the backbone of Trachodon. In cleaning the sacrum of No. 4928 ossified tendons were found embedded in the matrix, situated, as they must have been in life, in the muscles along the back on either side of the spinous processes of the vertebrae. This is the first time these tendons have been found so far posteriorly in a member of the Ceratopsia, although their presence there had been suspected.

^a Catalogue number of the U. S. National Museum.

^b American Journal of Science, (4), VI, p. 92.

^c Hatcher's original field number.

^d Marsh's number.

Sk. 29 is the largest of the *Triceratops* skulls preserved in the collection of this museum. The principal dimensions are as follows:

Greatest length from front of beak to back of parietal, 6 feet 5 inches.

Greatest length from front of beak to end of occipital condyle, about 4 feet.

Height of post-orbital horn-core, 30 inches.

Anterior-posterior diameter of same horn-core at base, 12 inches.

SKULL OF *DICERATOPS HATCHERI* Lull.^a

Plates XXXIII and XXXIV illustrate the front and side views of the skull of a new member of the *Ceratopsia* recently described^b by Mr. J. B. Hatcher as pertaining to a distinct genus and species.

The type, No. 2412^c (originally designated by the field number as Sk. 25), was collected about 3 miles southwest of the mouth of Lightning Creek, Converse County, Wyoming, by Messrs. Hatcher and Utterback, in 1891.

The skull is all that is known of this animal, and when found was inclosed in a hard sandstone concretion. According to Hatcher, this concretion "had entirely weathered out of the surrounding sandstone and stood at an altitude of 5 or 6 feet above the ground, firmly attached beneath to another concretion. The skull stood on its nose, with the frill pointing upward."

The tips of the horn-cores and the crest of the parietals had been eroded away. These portions (see Plate XXXIII) have been restored in plaster, but otherwise the skull is very complete and but little distorted for a fossil of such robust proportions.

The absence of a nasal horn-core and the presence of large fenestræ on either side of the frill (see Plate XXXIII) in the squamosals constitute the essential characters upon which this genus is based.

Doctor Lull, in a note following the description of this form, makes the suggestion that the openings in the squamosals may possibly be pathologic. While it is true that the two apertures are not symmetrical, the pathologic character of the anterior border of the larger opening would, to my mind, account for the asymmetry of the two fenestræ. A comparison of Hatcher's drawing of the dorsal view (Plate XIII, fig. 2^b) with the photograph of the anterior view (see Plate XXXIII of this paper) shows at once that the right opening has been incorrectly placed in the drawing. It will also be noticed that these

^a In editing Mr. Hatcher's Monograph on the *Ceratopsia*, Dr. R. S. Lull found in the manuscript a description of this specimen, to which, however, no name had been assigned. Doctor Lull has given it the very appropriate title of *Diceratops hatcheri*, the generic name being suggested by the lack of the nasal horn, while the specific name serves "to commemorate Mr. Hatcher's work in connection with this remarkable type."

^b American Journal of Science, XX, Dec., 1905, pp. 413-419, pl. xiii.

^c Catalogue number of the U. S. National Museum.

fenestræ (except in size, as explained above) are quite symmetrically placed, the distance from the lateral border being practically the same on either side. Although these openings occur on the unprotected border of the frill, it would be a remarkable coincidence for the animal to have been wounded in such an identical manner on both sides and in the places where the bone is heaviest.

The skull, as exhibited, was prepared by the writer:

Principal measurements.—Greatest length, 6 feet 1 inch; greatest breadth, 4 feet 2 inches.

A MOUNTED SKELETON OF MASTODON.

Of all the extinct animals none is found more widely distributed geographically, and probably few are better known to the layman, than the mastodon. It appears to be the popular belief that the mastodon was a very much larger animal than the elephant of to-day, but in reality it did not exceed the Indian elephant in size, though proportionately lower and more heavily built. The largest males rarely reached a height of 10 feet and the females were much smaller.

The mastodon skeleton (No. 2106)^a recently placed on exhibition (Plate XXXV) in the U. S. National Museum is a well-preserved specimen of an adult female, which has been identified by Mr. F. A. Lucas as pertaining to the species *Mammot americanum*.

The specimen was found in 1901 by Mr. Levi Wood in a peat swamp on his farm near Church, Michigan.

After exhuming a few of the best preserved bones, the right to disinter the remainder of the skeleton was purchased by the Museum authorities, and Mr. Alban Stewart was detailed to complete the excavating as well as to prepare the specimen for shipment to Washington.

It was found that, although the skeleton lay on its left side and apparently in good position for the preservation of all its parts, all of the leg bones were missing, except those of the right fore limb. The specimen is one of the many curious examples of the lack of important bones that one would naturally expect to be present, while other bones that might have been lost were preserved.

The skeleton was embedded in peat a few feet below the surface and immediately above an 18-inch stratum of blue clay.

The bones recovered consist of a skull and lower jaws, 1 tusk partially complete and the basal portion of the other, 7 cervicals, 17 dorsals, 3 lumbar, sacrum, 11 caudals, 30 ribs, a portion of the sternum, pelvis very complete, the right fore limb, and numerous foot bones.

The skeleton was first mounted by Mr. Alban Stewart, under the direction of Mr. Lucas, and was included as a portion of the National

^aCatalogue number of U. S. National Museum.

Museum exhibit at the Louisiana Purchase Exposition at St. Louis, Missouri, in 1904.

The missing parts were restored in plaster, with the exception of the left hind limb (No. 4980), which belongs to an individual of about the same size and proportions from Kimmswick, Missouri. The restored parts are colored to resemble the bone, although the shade differs sufficiently to be readily distinguished.

The skeleton at the highest point is about 7 feet 7 inches above the base and is 14 feet from the tip of the tusks to the tail.